

XX.—*Notes on Entomostraca taken chiefly in the Northumberland and Durham District (1869).* By GEORGE STEWARDSON BRADY, C.M.Z.S., &c. (Plates XII.—XIV.)

DURING the past year my attention—so far as Natural History is concerned—has been chiefly directed to the Entomostraca of tidal rivers; but having had some not altogether unproductive opportunities of collecting in localities of a different character, I propose now to lay the results of these “horæ subsecivæ” before the Club.

The gatherings which I have to notice are—

1. From between tide-marks: at Sunderland, and at Boulmer, near Alnwick.
2. From fresh water at Fulwell Cemetery, Sunderland.
3. Marine; from a depth of 15–30 fathoms off the Durham coast.

BOULMER AND SUNDERLAND.

These gatherings consisted of the muddy sand which is found not unfrequently coating flat shelving rocks, and matted together in many cases by dwarf filamentous Algæ of such genera as *Sphacelaria*, *Polysiphonia*, *Callithamnion*, &c. As a general rule, the tidal rocks of our district are too much storm-beaten to allow of their harbouring any great quantity of movable deposit of this kind, and it is only in somewhat sheltered nooks that the requisite conditions can be found. Several interesting species, new to the district, occurred in these localities, and it is not less interesting to note the occurrence abundantly in a living state of several which we had previously known only from the shell: in this category we may notice *Cytherura cellulosa* and several other species of that perplexing genus. The most noteworthy of the newly found species are *Cythere Robertsoni*, *Cytherura similis*, *flavescens*, *angulata*, *undata*, and *gibba*, *Paradoxostoma pulchellum*, *hibernicum*, and *Fischeri*.

The following is a complete list of the species obtained, the asterisks indicating their comparative abundance, * * * being

intended to denote the prevailing species, and * those which appear to be very scarce:—

	BOULMER.	SUNDERLAND
<i>Cythere lutea</i> , Müller.....	***	***
<i>viridis</i> , Müller	***	**
<i>albonaculata</i> , Baird	***	***
<i>pellucida</i> , Baird	***
<i>castanea</i> , G. O. Sars	***	*
<i>tenera</i> , Brady	*	**
<i>porcellanea</i> , Brady	***
<i>gibbosa</i> , B. & R.....	*
<i>Robertsoni</i> , Brady	*
<i>villosa</i> , (G. O. Sars)	**	*
<i>Loxocoencha tamarindus</i> , (Jones).....	**	**
<i>Xestoleberis aurantia</i> , (Baird).....	**
<i>Cytherura nigrescens</i> , (Baird)...	***	** (?)
<i>similis</i> , G. O. Sars	*
<i>flavescens</i> , Brady.....	***
<i>cuneata</i> , Brady.....	***
<i>striata</i> , G. O. Sars	**	*
<i>angulata</i> , Brady	*
<i>undata</i> , G. O. Sars.....	*
<i>gibba</i> , (Müller)	*
<i>cellulosa</i> , (Norman)	*	***
<i>Cytherideis subulata</i> , Brady	***	***
<i>Paradoxostoma variabile</i> , Baird)	**	**
<i>abbreviatum</i> , G. O. Sars ..	**	**
<i>hibernicum</i> , Brady.....	**
<i>Fischeri</i> , G. O. Sars	**
<i>ensifforme</i> , Brady	*
<i>pulchellum</i> , G. O. Sars	**
<i>Sclerochilus contortus</i> , (Norman).....	*	*

PARADOXOSTOMA HIBERNICUM, Brady. Plate XII., figs. 10, 11.

The type specimens of *P. hibernicum* were found in rock-pools in the Great Isle of Aran, Galway Bay, but, having been preserved in spirit, had lost the beautiful coloured markings which they doubtless possessed when living. I have therefore given here, from one of the Boulmer specimens, enlarged representations, which convey a better idea of this very distinct and handsome species.

PARADOXOSTOMA FISCHERI, G. O. Sars. Plate XII., figs. 1-3.

Paradoxostoma Fischeri, G. O. Sars. Oversigt af Norges marine Ostracoder, p. 96.

Sclerochilus gracilis, Brady and Robertson. Ann. and Mag. Nat. Hist., Ser. 4, Vol. III. (1869). Plate XX., figs. 11, 12.

The species described by Mr. Robertson and myself under the name *Sclerochilus gracilis*, was not recognized by us as being identical with the *P. Fischeri* of Sars. Indeed we had supposed it to belong, as our name indicates, to a different genus, arriving at this conclusion from a consideration of the form of the shell. The animal itself we had no opportunity of examining; but none of our specimens exhibited the beautiful dark coloured arborescent or dendritic markings so characteristic of the genus *Paradoxostoma*. The figures now given represent both male and female shells.

PARADOXOSTOMA PULCHELLUM, *G. O. Sars*. Plate XII., figs. 4, 5.

The male of this species has not previously been observed, but I presume, from the rather elongated form of the carapace, that the specimen here figured belongs to that sex.

FULWELL.

This gathering was taken from the almost dried-up bed of some ornamental water through which a small stream usually runs. The water had been let off previous to my visit, and all my captures were made in a small pool about two or three inches deep, which had been accidentally left behind. My impression is that even this spot had not long before been quite dry, as the mud brought up was (much of it) a good deal caked. My object in going to this spot was to obtain specimens of *Potamoecypris fulva*, which I thought I remembered having seen in gatherings previously obtained there, but which I did not at the time thoroughly recognize as distinct from *Cypridopsis villosa*. These earlier specimens were indeed recorded in my "Monograph" under the latter name, but as I now believe erroneously. I well remember the difficulty I felt in forming a judgment as to their specific character, and I was probably deterred from describing them as a new species by the fear of unnecessarily multiplying

names. My object this year was imperfectly attained by the capture of five or six specimens of this species, but I was fortunate in obtaining a much greater prize in an ostracod—*Cypris ornata*, Müller, new to the British fauna, and scarcely inferior to any in size and beauty. The gathering was interesting in another respect—several individuals of species usually white or whitish in colour, were distinctly tinted with green, not as a mere superficial stain, but in clouded patches evidently entering into the substance of the shell: these were *Candona candida*, *Cypris gibba*, and *Limnocythere inopinata*. The fact is useful as showing that colour must not be accepted as at all a constant or invariable character, even in species which seem to be most steadfast in that respect. The following list embraces all the Ostracoda found at Fulwell.

Cypris compressa, Baird.
gibba, Ramdohr.
virens, (Jurine.)
ornata, Müller.
reptans, (Baird.)

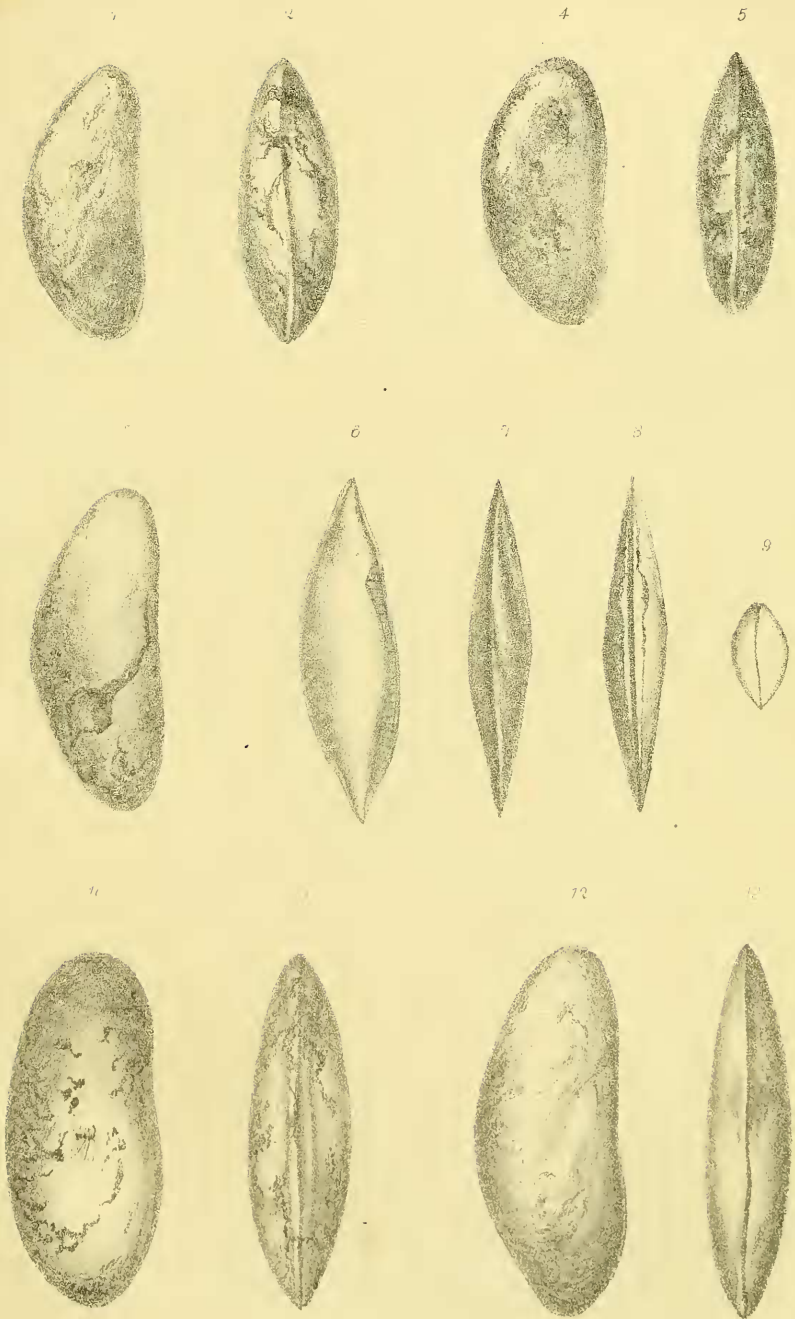
Cypridopsis obesa, Brady & Robert-
 son.
Potamocypris fulva, Brady.
Candona albicans, Brady.
Limnocythere inopinata, (Baird.)

CYPRIS ORNATA, Müller. Plate XIV., figs. 1-3.

Cypris ornata, Müller. Zool. Dan. prodrom. 2391.
 Entomotraca, p. 51, Tab. III., figs. 4-6. Lilljeborg.
 De Crustaceis, Tab. X., figs. 19-22—(not of Fischer—
 “Über das genus Cypris.”)

Monoculus ornatus, Jurine. Histoire des Monocles, p.
 170. Pl. XVII., figs. 1-4.

Carapace of the female, seen from the side, oblong, subreniform, higher in front than behind, greatest height situated a little in front of the middle and equal to half the length: extremities rounded, the posterior much narrowed, superior margin much elevated (almost gibbous) about the anterior third, thence sloping with a gentle curve backwards, inferior sinuated in the middle; seen from above oblong-ovate, widest in the middle, thence tapering evenly to the extremities which are pointed, greatest width considerably less than half the length. The shell



1



2



3



5



6



4



7



8



9



10



11





exhibits under the microscope, when placed in a favourable light, a delicately reticulated or tessellated structure (shown in figs. 1, 2, towards the posterior extremity); the surface is smooth and shining, pale green, beautifully but irregularly banded with dark green and orange. In my specimens the normal coloration seems to consist of an encircling fillet of orange with a transverse broad pellucid band behind the middle, and a sharply defined black patch over the eyes, beneath which are several dark green cloudy patches; but the appearances vary so largely, according to the method of illumination, that it is difficult to describe correctly even a single specimen, of which no two are exactly alike. Length, $\frac{1}{5}$ th of an inch. Setæ of lower antennæ very short, as in *C. reptans*.

I at first supposed that this might be the male of *C. virens*, which species occurred abundantly in the same gathering, but further examination showed the supposition to be incorrect, all my specimens being females. Some doubt may perhaps be entertained as to its identity with Müller and Jurine's species, but though their written descriptions are often very characteristic, their figures can scarcely be depended upon for perfect accuracy, and I am the more disposed to consider the reference correct, from Müller's description of the shell structure, "aucta valde magnitudine testa tessellata sive reticulata apparet, haud tamen pellucida." His description of the coloration agrees also closely with that of my specimens. Professor Lilljeborg's figures agree well with my examples and evidently refer to the same species; but Fischer has unaccountably identified Müller's *C. ornata* with the *C. virens* of Jurine (*tristriata*, Baird), the figures given by the two authors being widely different, much more so indeed than the species themselves actually are. Fischer's figures refer undoubtedly to *C. virens*, and not to the present species.

GENUS. POTAMOCYPRIS, nov. gen.,

Carapace compressed, reniform; shell calcareous and rather thick, valves unequal, the right much the larger and overlapping on the dorsal and in the middle of the ventral margin: dorsal

margin of the left valve somewhat flattened, that of the right boldly arched, hingement simple. Limbs short and stout, superior antennæ six-jointed, shortly setose, inferior altogether destitute of swimming setæ; first and second feet as in *Cypris*; abdomen rudimentary.

I have as yet met with only one perfect animal of this genus, though not a few empty shells have been found in various widely separated localities. These have always occurred in running water, not far from the sea, except in one or two cases where dead shells have been brought up by the dredge. Further opportunities will probably reveal more points of difference between this and the closely allied genus *Cypridopsis* than I am now able to point out. The marked inequality of the valves, together with the absence of swimming setæ from the lower antennæ, are however of sufficient importance to call for recognition as generic characters.

POTAMOCYPRIS FULVA, (*Brady.*) Plate XIV., fig. 4.

Bairdia fulva, Brady. Monog. recent Brit. Ostrac., p. 474. Pl. XVIII., fig. 21. Brady and Robertson. Ann. and Mag. Nat. Hist., Ser. 4, Vol. III. (1869). Plate XVIII., figs. 1-4.

The yellowish colour of the carapace from which this species was first described suggested to me the specific name, which proves however inappropriate, the one or two living specimens since found having been green. The one living example recently got at Fulwell is dull green, with a large patch of a darker shade about the centre of the dorsal margin, on which are one or two small orange blotches. The shell is usually (though not always) rather coarsely punctate and sparingly hispid. Its general appearance is somewhat like that of *Cypris villosa*, but larger and coarser: other more important distinctions are pointed out in the generic definition.

P. fulva has occurred in the following localities:—Roundstone Bay and River Liffey, Ireland; Scarpa Floe and Montrose Basin, Scotland; near the mouths of the Warn Burn, and rivers Coquet,

Wansbeck, and Blyth, Northumberland; and Fulwell Cemetery near Sunderland. In all places the number of specimens was very small, usually only one or two.

DURHAM COAST.

I am indebted to the kindness of the members of the Seaham Natural History Club for the opportunity of joining in an afternoon's dredging off that place. Of the larger marine animals nothing important was noticed, the ground dredged over not having been so favourable as on some previous occasions; but amongst Microzoa, especially Ostracoda, a large number of interesting captures were made, comprising many species new to our district. Before proceeding to enumerate these I may notice also the occurrence of a rotifer (*Brachionus Mülleri*) (?), and of the larval form of one of the Echinoidea, probably *Echinocyamus pusillus*.

The following Copepoda were also taken on this occasion—*Alteutha bopyroides*, *Dias longiremis*, *Pontellina brevicornis*, and an undescribed species allied to *Euterpe gracilis*, Claus.

LIST OF OSTRACODA.

<i>Pontocypris mytiloides</i> , (<i>Norman</i>)	* *
<i>Cythere pellucida</i> , <i>Baird</i>	* *
<i>castanea</i> , <i>G. O. Sars</i>	*
<i>tenera</i> , <i>Brady</i>	* *
<i>porcellanea</i> , <i>Brady</i>	* *
<i>Robertsoni</i> , <i>Brady</i>	*
<i>quadridentata</i> , <i>Baird</i>	* *
<i>emaciata</i> , <i>Brady</i>	*
<i>tuberculata</i> , (<i>G. O. Sars</i>)	* * *
<i>semipunctata</i> , <i>Brady</i>	*
<i>limicola</i> , (<i>Norman</i>)	* *
<i>Jonesii</i> , (<i>Baird</i>)	* *
<i>Encythere Argus</i> , (<i>G. O. Sars</i>).....	* *
<i>declivis</i> , (<i>Norman</i>)	* *
<i>anglica</i> , <i>Brady</i>	* *
<i>Cytheridea papillosa</i> , <i>Bosquet</i>	* * *
<i>Hyobates bartonensis</i> , (<i>Jones</i>)	*

<i>Loxococoncha tamarindus</i> , (<i>Jones</i>)	* *
<i>elliptica</i> , <i>Brady</i>	*
<i>guttata</i> , (<i>Norman</i>)	* * *
<i>multifora</i> , (<i>Norman</i>)	*
<i>granulata</i> , <i>G. O. Sars</i>	*
<i>Xestoleberis depressa</i> , <i>G. O. Sars</i>	* *
<i>Cytherura nigrescens</i> , (<i>Baird</i>)	*
<i>similis</i> , <i>G. O. Sars</i>	*
<i>producta</i> , <i>Brady</i>	* * *
<i>striata</i> , <i>G. O. Sars</i>	* *
<i>angulata</i> , <i>Brady</i>	* *
<i>cuneata</i> , <i>Brady</i>	*
<i>acuticostata</i> , <i>G. O. Sars</i>	* *
<i>cellulosa</i> , (<i>Norman</i>)	* *
<i>clathrata</i> , <i>G. O. Sars</i>	*
<i>Cytheropteron nodosum</i> , <i>Brady</i>	* *
<i>latissimum</i> , (<i>Norman</i>)	* * *
<i>Bythocythere simplex</i> , (<i>Norman</i>)	* *
<i>constricta</i> , <i>G. O. Sars</i>	* *
<i>Cytherideis subulata</i> , <i>Brady</i>	*
<i>Sclerochilus contortus</i> , (<i>Norman</i>)	* *
<i>Xiphichilus tenuissima</i> , (<i>Norman</i>)	* *
<i>Paradoxostoma variabile</i> , (<i>Baird</i>)	*
<i>ensiforme</i> , <i>Brady</i>	*
<i>flexuosum</i> , <i>Brady</i>	*
(?) <i>hibernicum</i> , <i>Brady</i>	*
<i>Hodgii</i> , <i>Brady</i> , nov. sp.	*

In all forty-four species, one of which (*Paradoxostoma Hodgii*) is new to science, and fifteen others are additions to our local Fauna.

LOXOCOCONCHA GRANULATA, *G. O. Sars*,

Was figured in my "Monograph of the recent British Ostracoda" from a single specimen taken at Stranraer. Some doubt however still existed as to the identity of the specimens, and the figure given was not large enough to represent it satisfactorily. I have therefore here drawn, on a larger scale, the specimen recently dredged off the Durham coast. This species, though probably widely distributed, seems to be scarce in point of

numbers, except in a dredging recently made by Mr. Robertson in Loch Long, where it occurs abundantly.

GENUS. XIPHICHILUS,* nov. gen.

Shell thin and fragile, smooth; valves compressed, elongated, pointed at both ends, nearly equal, ventral margins much compressed, forming a flattened knife-like plate which is widest behind the middle, and marked by several transverse, hair-like lines: outline, as seen from above, compressed, bi-fusiform; hinge simple. Limbs excessively long and slender: superior antenna six-jointed, and quite destitute of setæ, inferior sparingly setose; mandibles very long and slender, styli-form, palp (?) bi-articulate, slender, and terminating in two long setæ. Abdomen produced into two long tapering processes.

Only two members of this genus are yet known, both of which are here for the first time figured. Though very nearly allied, in internal anatomical structure, to *Paradoxostoma*, the characters of the shell are such as to suggest the propriety of placing them in a distinct genus, and some slight anatomical differences appear to confirm this view. The very remarkable external appearance of the shell will be at once recognized on reference to the plates.

XIPHICHILUS TENUISSIMA, (Norman.) Plate XII., figs. 6-9; and Plate XIV., figs. 5-10.

Bythocythere tenuissima, Norman. Brit. Assoc. Report (1868), p. 294.

The shell of this species has been well described by Mr. Norman, and was by him referred (owing to some general likeness to that of *B. simplex*) to the genus *Bythocythere*. But an examination of the contained animal, which I have been fortunate enough to obtain recently in good condition, compels me to remove it from the position provisionally assigned to it by Mr. Norman.

* Ξιφος a sword; χεῖλος a margin.

The superior antennæ are excessively slender, having the first four joints of near equal length and about nine times as long as broad, the last two about one-third the length of the preceding: the lower antennæ have a single seta at the apex of each joint and one in the middle of the penultimate; urticating seta long and slender, triarticulate. Last leg having the second joint excessively long, the third about one-fourth and the last one half of its length; unguis long, slender, and slightly curved. Length, $\frac{1}{10}$ th of an inch.

Dredged in 15–30 fathoms, about eight miles from shore, between Sunderland and Seaham Harbour. Apparently not very scarce, as a good series of specimens was obtained on this occasion. It is remarkable, however, that so large a species should have been overlooked, if it were present, in dredgings made on previous occasions in the same district. Two explanations suggest themselves—first, that the habitat of the species may be restricted to an area north of Seaham which was dredged on this occasion, other dredgings having been uniformly made further south; or secondly, that it may have been previously passed over as the larva of a cirriped, to which it bears a very striking resemblance when seen through a simple hand lens. Mr. Robertson has recently taken this species in Kilchattan Bay, Ayrshire.

XIPHICHILUS AMYGDALOIDES, nov. sp. Plate XIII., figs. 8–10.

Carapace as seen from the side oblong-oval or almond-shaped, tapering gently to the extremities which are much narrowed, rounded, and nearly equal in breadth, superior margin gently and evenly arched, inferior also arched, but slightly sinuated in front of the middle, greatest height in the middle and equal to rather more than one-third of the length. Seen from above much compressed, rhomboidal or doubly fusiform, tapering equally from the middle, where it is widest, to the subacutely pointed extremities; greatest width equal to about half the height or one-fifth of the length. Surface perfectly smooth; the transverse lines of the knife-like ventral margin very

conspicuous when seen from below (fig. 10). Animal unknown. Length, $\frac{1}{30}$ th of an inch.

One specimen only dredged by Mr. Jeffreys, in St. Magnus Bay, Shetland.

PARADOXOSTOMA HODGII, nov. sp. Plate XII., figs. 12, 13.

Carapace as seen from the side elongate subarcuate; greatest height situate in the middle and not much exceeding one-third of the length, extremities narrowed, rounded; superior margin boldly arched, inferior sinuated in the middle, curving gently upwards behind: seen from above much compressed, linear ovate, widest in the middle, tapering gradually and evenly to the extremities which are subacutely pointed; width scarcely exceeding one-fifth of the length. Shell smooth and polished, transparent, yellowish, the limbs of the animal showing plainly through. Length, $\frac{1}{40}$ th of an inch.

I have much pleasure in dedicating this species to Mr. George Hodge, of Seaham Harbour, in recognition of the kind assistance which he has often afforded me, as well as of his numerous contributions to the zoological literature of this district.

CYTHERURA INSOLITA, nov. sp. Plate XIII., figs. 11, 12.

Carapace as seen from the side oblong, subquadrangular, highest in the middle; greatest height equal to about half the length; anterior extremity rounded, posterior almost rectangularly truncate and produced at its upper extremity into a slender acutely pointed process; superior margin evenly arched, inferior almost straight: seen from above the outline is compressed, subcuneiform, obtusely pointed in front, centrally mucronate behind; greatest width behind the middle, equal to not much more than one-third of the length. Shell-surface smooth, distinctly and rather largely punctate behind the middle; colour yellowish, central areola almost black. Length, $\frac{1}{40}$ th of an inch.

Dredged by Mr. D. Robertson, off Orkney.

BYTHOCY THERE TURGIDA, *G. O. Sars.* Plate XIII., figs. 1-4.

Also gained admission into my "Monograph" on the strength of a single female carapace, dredged probably off Holy Island. The shell now under notice belongs to the male, and was dredged off Eddystone Lighthouse. For the opportunity of figuring it I am indebted to my friend Mr. D. Robertson, of Glasgow, who has more recently taken it abundantly in Kilchattan Bay, Ayrshire.

EXPLANATION OF PLATES.

PLATE XII.

- Fig. 1. *Paradoxostoma Fischeri*, female, seen from left side, $\times 84$.
 Fig. 2. " " " from above, $\times 84$.
 Fig. 3. " " male, from left side, $\times 84$.
 Fig. 4. " pulchellum, male, from left side, $\times 84$.
 Fig. 5. " " " from above, $\times 84$.
 Fig. 6. *Xiphichilus tenuissima*, female, from left side. $\times 40$.
 Fig. 7. " " " from above, $\times 40$.
 Fig. 8. " " " from below, $\times 40$.
 Fig. 9. " " " from front, $\times 40$.
 Fig. 10. *Paradoxostoma hibernicum*, (? male), from left side, $\times 84$.
 Fig. 11. " " " from below, $\times 84$.
 Fig. 12. " *Hodgii*, from left side, $\times 84$.
 Fig. 13. " " " from below, $\times 84$.

PLATE XIII.

- Fig. 1. *Bythocythere turgida*, (? male), from left side, $\times 40$.
 Fig. 2. " " " from above, $\times 40$.
 Fig. 3. " " " from below, $\times 40$.
 Fig. 4. " " " from front, $\times 40$.
 Fig. 5. *Loxocoelona granulata*, (? female), from left side, $\times 84$.
 Fig. 6. " " " from above, $\times 84$.
 Fig. 7. " " " from front, $\times 84$.
 Fig. 8. *Xiphichilus amygdaloides*, from left side, $\times 40$.
 Fig. 9. " " " from above, $\times 40$.
 Fig. 10. " " " from below, $\times 40$.
 Fig. 11. *Cytherura insolita*, from left side, $\times 60$.
 Fig. 12. " " " from below, $\times 60$.

PLATE XIV.

- Fig. 1. *Cypris ornata*, female, seen from left side, $\times 40$.
 Fig. 2. " " " from above, $\times 40$.
 Fig. 3. " " post-abdominal ramus, $\times 84$.
 Fig. 4. *Potamocypris fulva*, lower antenna, $\times 210$.
 Fig. 5. *Xiphichilus tenuissima*, female, upper antenna, $\times 210$.
 Fig. 6. " " lower antenna, $\times 210$.
 Fig. 7. " " mandible, $\times 210$.
 Fig. 8. " " first maxilla, (?) $\times 210$.
 Fig. 9. " " last foot, $\times 210$.
 Fig. 10. " " abdomen, $\times 210$.
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XXI.—*On the Teeth of the Ballan Wrasse (Labrus maculatus)*,
 By JOSEPH WRIGHT. (Plate XV.)

HAVING lately had an opportunity of examining the teeth of the Ballan Wrasse (*Labrus maculatus*), and finding them to be interesting examples of tipped teeth, similar to those of some of the fossil fish of our Coal-Measures, I venture to lay before the Club the result of my observations.

About two years ago, in a paper read before one of the scientific societies of the metropolis, on the teeth of some fossil fishes, this peculiar structure was pointed out as new, and was considered of such importance that a new genus was based on it. Yet, notwithstanding this statement, the same structure had been described nearly thirty years before by Agassiz, in his great work on the fossil fishes, and was shown by him to exist in *Pygopterus* and *Saurichthys*, and also in the recent genera *Polypterus* and *Lepidosteus*. In the last part of the Transactions of this Club, the same structure is described as being found in the teeth of *Gyrolepis*, *Amblypterus*, *Pygopteris*, and *Cycloptychius*: Mr. Atthey also informs me that he has found the same structure in *Acrolepis*, which he has obtained from the Marl Slate. But we need not be astonished that the author of the paper referred to had not seen this structure in the fossil fishes